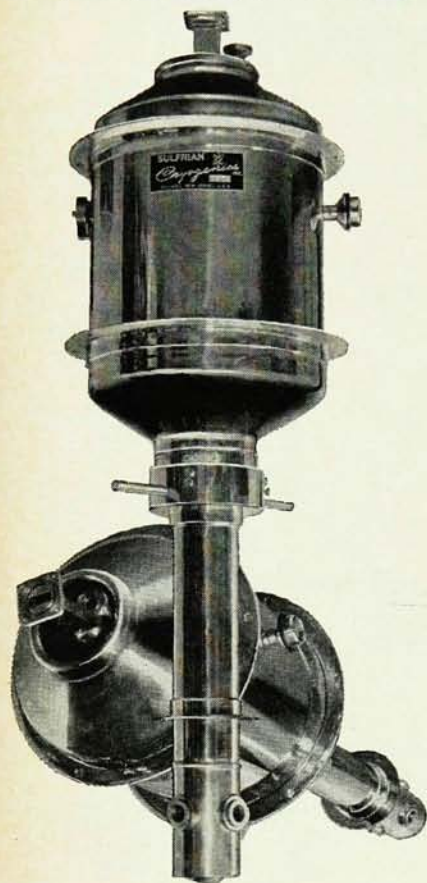


SULFRIAN STAINLESS STEEL LIQUID HELIUM MICROWAVE DEWARs



For use in the evaluation and measurement of K-band microwaves, optic and X-irradiation, and electrical inputs. The K-band waveguide, waveguide flange, and electrical inputs are all included. Bottom sample block designed for a resonant cavity and contains five optical viewing ports. Quartz or beryllium windows may be used. Liquid helium capacity is two liters. Liquid nitrogen capacity three liters.

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new observations and current interpretations and gives little indication of the numerous puzzles and questions that these observations raise.

No question remains unanswered, though competing theories do share credit at times. Thus students may view astronomy as a collection of facts now known, rather than a collection of questions to be answered.

The book will remain a useful reference accessible to readers without a college math or science background. Numerous problems and a few recent references with each chapter aid the student. However, several more recent books—Krogdahl's "The Astronomical Universe" is a good example—merit higher grades as a modern college text for many schools.

Lasers and Applications. Symp. Proc. (Columbus, Ohio, 1962) W. S. C. Chang, ed. 267 pp. Ohio State Univ. Press, Columbus, 1963. \$7.00.

Reviewed by H. J. Hagger, *Albiswerk* Zürich, Switzerland.

The field of quantum electronics which the lasers belong to has advanced very rapidly, and new discoveries follow each other. So in this situation a symposium conducted in short sequence on such a very special subject seems necessary. A collection of papers of the Symposium on Lasers organized in Columbus, Ohio, November 7-8, 1962, is presented by W. S. C. Chang. Optical and semiconductor lasers are considered. The most recent and interesting materials, such as CaF_2 , and new pumping methods are described, e.g., double pumping, pumping by exploding wires, etc. Nonlinear properties, especially in connection with modulating and mixing optical frequencies, as well as parametric photo interaction between radiation and matter, are studied. In the application section, absorption in water vapor of laser radiation and satellite tracking systems are considered. Some experimental results on coherence of laser output and on the interference patterns of the ruby-laser end surface are given.

This book gives a good survey on the state of the art, and it may serve well as a collection of data and ideas and as a discussion of the most recent problems. It is intended for the man

working in lasers, and it fulfills this purpose very well. Thus it can be highly recommended in this respect, but one must look at it as a survey book on the state of the art which may be out-dated to some extent at the moment the next symposium is held or entirely new discoveries on this subject are made.

Waves and Oscillations. By R. A. Waldron. 135 pp. Van Nostrand, Princeton, N. J., 1964. Paper, \$1.75.

Reviewed by Richard V. Waterhouse, *The American University*.

This is the fourth of a series named Momentum Books, issued under the general editorship of E. U. Condon. These books, says the blurb, "were conceived with a purpose . . ." (no labours of love here, presumably!) "to serve the modern inquiring mind. Scientist, engineer, teacher, student, inquisitive layman . . . will find, etc. etc. Each Momentum book is a lucid and accurate analysis of an area of . . . physics".

In pursuit of this compendious goal, the author proceeds to pack a good collection of material into the pages at his disposal. In compiling such a book, there is a huge amount of material to choose from, and it seems reasonable for an author to follow his personal taste in the selection. Here electromagnetic waves, in and out of wave guides, receive the most attention, and this reflects the main professional interest of the author. There is a gesture in the direction of wave mechanics: the author devotes 2 pages to Schrödinger's equation and the uncertainty principle, but for the rest the waves treated are classical ones. Reflection, refraction, interference, and diffraction are discussed. Masers are mentioned, but only in a footnote.

The treatment is mostly at an undergraduate level, although the author occasionally drops a more recondite titbit to spur further investigation; for example, he mentions that the real and imaginary parts of the impedance of an electrical network, given as functions of frequency, are mutually dependent, being a pair of Hilbert transforms.

The use of language is generally adequate although in the introduction the author manages to contradict